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MOLLUSCA INJURIOUS TO FARMERS AND GARDENERS.

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MOLLUSCS have received but little attention from an economic point of view, yet they cause a great deal of loss amongst our field and garden crops, as well as being indirectly the agents of serious diseases in sheep, which are often fatal. Curtis, in his 'Farm Insects,' refers briefly to Slugs and Snails. Miss Ormerod, in her valuable Reports, also gives a few useful notes regarding Water Snails; but there seems to be no complete account published of the injurious species.

The Mollusca that are injurious to our crops all belong to the two groups, the *Helicidæ* and the *Limacidæ*, both terrestrial in habits. The group which aids in the production of the sheep disease (liver-fluke) is the *Limacidæ* (or Water Snails), molluscs which, although abundant in water, are often found wandering upon land. It is through these *Limacidæ* that the sheep in all parts of the world become afflicted with that wasting disease produced by the liver-fluke. Although they are generally considered aquatic Mollusca, it must be remembered that most of them pass some time upon land, and may therefore be considered amphibious, whilst others scarcely go near the water.

The *Limacidæ* are found at all elevations. In our own country they are found in and around the mountain tarns of Scotland; in the Pyrenees, according to Moquin-Tandon, they are found at a height of 1200 metres. Most of the species are slow crawling creatures. Like all Mollusca, they are hermaphrodite,

and it is not unusual to see several together during the season of reproduction. All the members of the genus *Limnæus* frequent shallow and still waters or damp fields, and are most prolific and gregarious. They may be found at nearly all times of the year. The shells of these water-snails are elongated or conically oval, the spire usually produced, dextral, or turning from left to right. The body of the snail is twisted in the spiral and long; the head is very prominent; tentacles short, triangular, and depressed; the foot oblong, notched in front and rounded behind. Some species have the shell enveloped by folds of the mantle. Like many Mollusca, the *Limnæidæ* are extremely variable, one common English species, *Limnæa peregra*, having at least fourteen well-marked varieties.

In this country, and in Europe generally, the two species of economic importance are *L. truncatula* (= *minuta* of Draparnaud) and *L. peregra*. Both these species, which are cosmopolitan, are the hosts of the flukes (*Distomidæ*), especially the all-important liver-fluke (*Distomum hepaticum*), which causes the "liver-rot" in sheep. The eggs of the fluke are voided in the sheep's excreta on to the grass and around the ditches and ponds. The little infuseriform embryos coming from them pass, if they can, into the water, and are very active; if they meet with one of these two water-snails within twenty-four hours they pass into it, and there they remain, giving rise to other stages of their life-history (redia and sporocysts). These give rise to another stage, the so-called *Cercariæ*, which leave the mollusc and become free-swimming. They then encyst on the grass near the water, and, being eaten by the sheep, turn into the fluke. If these embryos did not meet with a *Limnæa* they would die, and the fluke would disappear from our sheep. Thus the importance of these water-snails can be readily seen. By far the greater number of these embryos enter *L. truncatula* of Müller, the *L. minuta* of Draparnaud) which is described below.

L. truncatula.—Shell oblong-conic, turreted, shiny, pale, horny, ashy grey, five to six whorls, which are rounded and convex, but slightly compressed in the middle, last whorl large and expanded, occupying about three-fifths of shell; spire of shell tapers to a very fine point; mouth oval; outer lip sharp, inner lip continuous with it and reflected on the columella; height about 8 mm., diameter 3 to 5 mm. This species is found over



the whole of England and France, and in nearly all European countries. It is also met with in Siberia, Afghanistan, Thibet, Amoor, Morocco, Algeria, Abyssinia, Tunisia, Canary Islands, and Færoe Islands. I do not know of its record in the Shetland Islands; the fluke, however, I think exists there. It has also been found in a semi-fossil state in various recent formations, and in the Upper Tertiary beds. It deposits its eggs or spawn upon the mud around ponds, ditches, and streams, where it lives. The eggs are laid in batches of 30 to 100, each snail laying as many as 1500 eggs during its life. The eggs are united in strips of a gelatinous consistency. In about two weeks these give rise to the young shells. Occasionally embryo flukes have been found in *L. peregra* of Müller, but they have always been in the young stage; I believe, however, that they use this species as a host in the same way that they do *truncatula*.

L. peregra. — Length about 0.75, breadth 0.425. Shell obliquely ovate, thin, and moderately glossy, almost transparent pale yellowish brown, spirally striate; striæ minute; also a few indistinct spiral ridges and marks; whorls five, last occupying three-fourths of shell; spire of shell pointed. Body pale yellowish grey, with an olive-green tinge mottled with black and covered with small yellow and white specks. Extremely abundant and variable. Found in lakes, ponds, canals, &c., wherever there is water. Like *truncatula* it may be found in Afghanistan, and abundantly in all Europe. It is a slow-moving creature, but often wanders far from any water into damp meadows, and is sometimes found crawling up willow trees. It is extremely prolific, the eggs being laid in strings of 12 to 180, and as many as 1300 in one season, according to Jeffreys. They are often carnivorous, living one upon another if kept in an aquarium. In North America *L. humilis* (Say) plays the part of intermediate host of this Trematode worm, and in Argentina *L. viator*, Orb., takes the place of our two species.

DESTRUCTION OF WATER-SNAILS.—It is of course extremely difficult to see how we can get rid of these water-snails; there is no doubt, however, that the suggestion made by Miss Ormerod, of "clearing the shallow pools of weeds and removing the broad band of weed-growth or stagnant mud from the entrance end of the pool," would greatly lessen the quantity of water-snails. The

constant clearing out of all ditches and dykes and pools would, of course, be most beneficial, especially if the weeds and mud are burnt, so that the eggs of the snails are destroyed, or lime and salt sprinkled over the mud, so as to kill those of *truncatulus* as well as the snails themselves, and any escaped embryos of the flukes. Beyond this little else seems practicable.

SLUGS (*Limacidæ*) AND SNAILS (*Helicidæ*).—Snails and slugs are great pests to the gardener, and every now and then a plague of one or the other makes its appearance and attacks our field crops. Both snails and slugs possess a head which bears tentacles, and also a pair of eyes which may be borne at the tip of these tentacles. The foot is flattened. Snails possess lips, but the organ they use for destroying plant-tissues is the curious swollen rasping tongue, the "radula," the surface of which is covered by rows of variously arranged teeth. They breathe by means of the highly vascular inner walls of the mantle-cavity. Snails and slugs are hermaphrodite. The eggs are laid in batches in the ground and under stones. The injurious snails belong chiefly to the genus *Helix*. Almost every wood and hedge, field and garden yields some kind of *Helix*; others are partial to the sands near the sea, water-courses, and damp places. Their habits are nocturnal and crepuscular, and are seldom seen crawling in the daytime, unless after heavy rains. This latter habit has given rise to the popular idea that the occasional snail-plagues come in the rain-clouds. As soon as the sun shines they crawl to some shelter—under stones, moss, or beneath the leaves of the plants they attack. When the breeding season is on, the male organs of each snail are supplemented by one or more curious crystalline darts, which they thrust out at one another: these curious structures are found in special sacs (the so-called "dart-sacs"), and are peculiar to the genus *Helix*. The eggs are generally round, white, semi-transparent bodies, and are always laid in batches in slanting galleries under ground formed by the "mother" snail. The slugs (*Limacidæ*), unlike the snails, have only a rudimentary shell, or an indefinitely formed one placed under the mantle. They mostly frequent damp and shady places, and during daytime they bury themselves in tunnels under the earth. Unlike the snails, they generally deposit their eggs singly under the ground, and the eggs are very numerous. The two chief genera are *Arion* and *Limax*, the former being distinguished

by having a slime-gland in the posterior extremity, and by having the respiratory orifice in front instead of behind the shield. They both feed at night, selecting the tenderest and choicest plants, but they will devour almost anything. The *Limaces* are very fond of indoor habitations, being found in cellars and outhouses. They destroy the corks in wine-cellars, and do much damage in that way; but, on the other hand, it is said they live upon the destructive "dry-rot" fungus. They all exude a glutinous kind of slime.

The following species of snails have been brought to my notice every now and then as doing much damage to farm crops and vegetables:—

The Garden Snail, *Helix aspersa*, Müller, is a large and abundant species, often doing much harm in the garden, not only to vegetables, but even to wall-fruit. Several instances of the total destruction of peach- and apricot-leaves by this snail have been brought to my notice. The years 1884 and 1889 were remarkable for the number of this snail seen about. The eggs are laid in small batches in the earth, about sixty or seventy in each heap. The ova are white, shining, globular bodies; they hatch in about fifteen days, if kept in damp places. The young snails are almost colourless, and the shell is thin and transparent; they grow rapidly. Drought and cold are erroneously considered prejudicial to all snails: at the approach of winter they collect together and exude a slimy matter, which hardens on exposure and closes the aperture of the shell. They may then be found hibernating together in crevices in walls, in old trees, and under rubbish, united together by the agglutinated slime. I have notes of the damage caused by this snail in most counties of the south of England.

H. nemoralis, Linn., is an extremely abundant snail in hedgerows and upland pastures, and especially in clover, where it often does much damage. It has a handsome shell, subject to much variety in regard to colour, and is very hardy. It is one of the first to make its appearance in the spring, and often does much damage to young turnips and lettuce as well as clover. In the typical *nemoralis* the lip is black. The colour of shell is extremely variable, being white, grey, pale yellow, pink, or brown, with 1 to 5 spiral brown bands, occa-



sionally confluent or interrupted; whorls $5\frac{1}{2}$, convex, last $\frac{3}{8}$ of shell. The body of the mollusc is dark brown, tinged with yellow, and covered with small tubercles; mantle greenish, with yellow specks; tentacles long and slender.

A well-marked variety, at one time regarded as specifically distinct, is *H. hortensis*, which has the mouth white-lipped and the rib of the same colour. A variety known as *hybrida* has the mouth and rib of a pink colour. The arrangement of the bands and markings of the shell are extremely variable, as is also the colour of the animal itself. I have seen clover and lucerne literally stripped by this snail in Wiltshire and in Wales.

H. rufescens, Pennant, is a constant source of annoyance to strawberry-growers, preferring those plants and violets to all other plants. I have seen beds of strawberries in Surrey and Cambridgeshire quite spoilt by this snail, and the fruit is attacked as well as the young leaves. These snails are seldom seen in the daytime, unless after a shower of rain, when they at once become active. They may often be seen in summer under the straw which is sometimes placed between the plants. They deposit their eggs from September to November, each snail depositing about sixty eggs. In my breeding-case the eggs were on the ground in heaps, but I think naturally they place them below the surface of the ground. The ova hatch in about three weeks, but a few remain undeveloped until the spring. The small snails do not grow very rapidly, as is the case with *Helix aspersa*. The shell is compressed above and angularly rounded below, opaque pale dirty grey, often with a reddish-brown hue, sometimes transversely streaked with brown and marked with a white spiral band which passes round the last whorl; whorls 6—7; last whorl = $\frac{1}{2}$ -shell; mouth obliquely semilunar, furnished inside with a broad white rib. The body of the snail is yellowish brown with dark brown stripes running along the neck and on the tentacles; foot pale, narrow and slender.

H. virgata, Da Costa, often does much harm to root crops and grass lands. During the past year it appeared in large numbers in parts of Kent, where it is well known on account of its destructive habits. At Wye, on the farm belonging to the S.E. Agricultural College, this and another snail caused much loss amongst mustard plants, coming down whenever there was any moisture from the chalk downs above the farm.

H. virgata is one of the species that has given rise to the popular notion that snails come down in the rain. It is an extremely abundant and gregarious species, and may be seen in damp weather in vast numbers clinging to the plants. Directly the air becomes dry it retires into the ground amongst the herbage, and there remains hidden until fresh rain comes, when it suddenly reappears. In dry weather it becomes dispersed by the wind, particularly on the downs and sandy heaths, and especially along the sea-coast. Although, as above shown, it sometimes does much harm it is said to have the redeeming quality of imparting a fine flavour to our south-country mutton, being taken up by the sheep when grazing, and considered to be very nutritious. There is no doubt of that, though I very much doubt if they flavour the meat. *H. virgata* is active in the coldest weather and does not hibernate. During the past cold winter I found, on the down at Wye, several of this species quite active. Eggs are laid in clusters of three or four from September to November and even in December. The shell is conical, with a broad and convex base, white or creamy, with a single purplish-brown band above the periphery, and sometimes as many as six or seven below it, more often two or three: the colour is very variable, sometimes plain white, brown, or grey, with white bands; occasionally the dark bands are broken, so as to make the shell appear spotted; whorls 6, last = $\frac{1}{2}$ -shell; mouth purplish inside, with a strong rib, sometimes purple, sometimes white. Several varieties are known. The body of this snail is dusky grey, and coarsely tubercled; mantle dark violet, speckled with white and brown.

H. caperata is a sluggish species which seldom moves except after rain. It is found generally under stones and wood, and on grass stalks in dry places. It is very abundant often in corn-fields. At Wye last year it was observed in large numbers with *H. virgata*. The ova, round, white, and opaque, are laid in September and October, each snail depositing about forty, which hatch in three weeks. The young are quite transparent. I have seen it doing much harm in France. *H. caperata* differs from *H. virgata* in its much smaller size, its flattened spire, its larger umbilicus, and the rib-like striæ which encircle each whorl. There are other snails which now and then become superabundant to do harm, but so far as my experience goes they are of exceptional occurrence.



Of Slugs the three most destructive species are *Arion ater*, *Limax agrestis*, and *L. maximus*.

Arion ater (Linn.), or the Black Slug, is found in damp woods, gardens, and hedges; and during the day under stones, logs of wood, and even tunnelling under ground; it reappears, however, directly after rain, and attacks all kinds of soft succulent leaves. It is a great pest in gardens and fields. At the same time it acts as a scavenger. This species has a variety of names on account of its variable colour. Férussac named it *A. empiricorum*, on account of the calcareous matter found under the shield having been used in medicines. It is also now identified with *A. flavus*, though at one time considered to be a distinct species. The shell of *A. ater* consists of small separate calcareous grains of unequal size. The colour of the body varies from black to red, yellow, green, brown, and occasionally a dirty yellowish white, covered with large prominent tubercles, often much contracted and rounded in front and somewhat pointed behind; the mantle is paler than the rest of body; the tentacles much swollen distally; foot with yellowish border; slime of a yellowish colour. The eggs, which are oval, white, opaque bodies, take about a month to develope. The young grow slowly, and apparently do not attain the adult condition until they are a year old.

Limax agrestis, Linn., the Grey Field Slug, is by far the most injurious to vegetation of all the land Mollusca. It may be found in almost every garden and field throughout this country and most parts of Europe, as well as in Siberia, Madeira, and Algeria. Like all slugs, its life is dependent on moisture. In dry weather we find it rolled up under a stone, coming out to feed by night and during wet weather. According to one authority, this mollusc feeds upon earthworms.* The body is spindle-shaped, ashy grey, with reddish or yellowish tinge, and sometimes mottled; early in the year it is of a much paler colour; the shield is large; the foot has pale sides; and it exudes an abundant viscous slime. The shell is oval and concave on under side, very thin, marked with indistinct lines of growth, with a broad membranous margin, obliquely striated.

This species is most prolific; as a rule seven or eight distinct batches are annually produced of fifty ova each. The breeding season is from May to November. The ova are deposited in

* In this case it has been probably mistaken for *Testacella haliotidea*, which preys almost exclusively on earthworms.

heaps of six to fifteen, in the ground and amongst moss. August, September, and October are the chief breeding months. A single snail will lay as many as 500 ova in the season. The eggs take three or four weeks to develop, the young being about one-twelfth of an inch long. Some that I kept reached the adult state in about two months, but they more often take much longer to reach maturity. These slugs live many years. The ova have great resistive powers as regards temperature and drought. Directly cold dry weather comes, they shrivel up and appear spoilt; but with moisture they are again distended. In this way they may be dried time after time in a stove and yet the ova will retain their vitality. Spring and autumn are the seasons when they appear most numerous. They attack cabbage, rape, wheat, clover, lettuce, turnips, in fact most vegetation. They eat the young turnips off just above the ground. In the winter months this slug may be found in large numbers under stones, decaying logs, and rubbish, in a semi-torpid condition. During the past spring they attacked the wheat in Kent, and did much harm.

Another very destructive species is *L. maximus*, Linn., the Black-striped Slug, the largest of its kind and sometimes reaches a length of seven inches. Although not very prolific it does much harm. It is very inactive, and exudes a thick gummy iridescent slime. The ova are deposited in little clusters, agglutinated by mucus, during the autumn, and in about four weeks are hatched. The young at once commence to devour the nearest vegetation. This species will live for some years; one I kept for five years continued to grow all the time. Its shell is somewhat rectangular, elongated and convex above, crystalline and glossy, with distinct lines of growth; boss small near one end; margin very thin. The body is slender, variable in colour. Some are black; others yellowish grey and spotted with black and white; numerous tubercles cover the skin; tentacles, long and yellowish-brown; back very much rounded; foot edged with white. Slime iridescent when dry, white when fresh.

There are other slugs less destructive in their habits, but the above-mentioned are the most noteworthy pests to the farmer and gardener.

METHODS OF DESTROYING SLUGS AND SNAILS.—Economically, the most important points in the natural history of slugs and snails are, first, that they chiefly live and flourish in damp places; drainage, therefore, must have a good effect in lessening

their numbers. In cases where this has been properly carried out, success has attended the experiments. Secondly, it should be noted that slugs have the power of expelling a great quantity of slime, which would naturally take up any poison in the form of powder that may be laid down in their way; and although they have the power to crawl as it were out of this slimy covering, and so leave the poison behind them, they cannot long continue to supply this mucous matter, so that if two or more dressings are applied soon after each other, the cuticle of the slug may be reached. Dressings of salt and lime are by far the most successful for destroying these pests, two or three dressings being given, the second one some ten to fifteen minutes after the first. Salt applied at the rate of four or five bushels per acre, and lime at the rate of ten to twelve bushels per acre, will clear any field of these noxious creatures, if done over *twice* in succession, salt especially having an injurious effect on the mucous membrane. It is useless, of course, to dress a field in the hot part of the day, or in very dry weather. The dressings should be applied when the slugs and snails are active, that is after heavy rains, and in the *evening* and *early* morning, before the sun is up; for as the sun rises the slugs, &c., disappear. Slacked lime has no effect upon them. Snails are more difficult to destroy, owing to their retracting their bodies into the shell and closing the aperture; and as they can live for several years without food, they offer many difficulties in the methods of destruction. Dressings of soot seem to be the most beneficial; the soot making the plant and ground obnoxious to the snails, drives them from the land. Nitrate of soda is likewise a very good dressing, both for slugs and snails, as well as for stimulating plant-growth. Snails have many natural enemies in birds. Thrushes and Blackbirds especially do much good in keeping them in check. Ducks, Starlings, Rooks, and Pigeons also eat them greedily; as do also Moles, Shrews, and Toads. Several species of mites are parasitic on slugs, but do not seem to affect them injuriously. In gardens slugs and snails may be destroyed by various traps: pieces of turnip and cabbage-leaves, spread upon the ground, collected at night, will be found to have attracted numbers from the surrounding soil; they can then be easily put into a pail of lime and so destroyed. But in the fields the only practicable way of destroying them is by dressings, as

above stated, of lime and salt, applied especially in damp weather, when these pests are most active. Several gardeners have told me they have experienced very successful results by using ordinary wood-ash, dusted over the infected plant when the dew is on the leaf. In places where the snails come from neighbouring downs or woods a small trench may be dug along the border of the field and filled with soot and lime, or better still, with salt and lime, a precaution which will prevent them reaching the crop; and if the trench be about a foot wide many of the snails and most of the slugs will be killed in it. Much good may also be done by destroying rubbish heaps, and removing stones which protect them from the heat and dryness of the air. Many ova are deposited in heaps of leaf-mould. If these heaps are dressed with quicklime, all the ova will be destroyed, as well as many other vermin certain to be present. Rockeries and ferneries in and near gardens are often centres from which numberless snails proceed. All rough herbage should be cleared off these in the winter, and in the spring a good dressing of soot put over them to kill the vermin that have hybernated there. As a means of attracting these pests there is no better plan than that of putting brewers' grains near the plants that are being attacked; both snails and slugs readily go to this and remain there. These heaps may then be removed and burnt; or quicklime and sulphur mixed together with water may be put over them, and will kill the pests which are feeding there. In this way a garden may soon be cleared of them. During the past spring the South of England has been visited by large numbers of snails and slugs. In many districts it was found almost impossible to keep the hordes of *L. agrestis* off the early peas and other early garden produce. A certain amount of success attended watering with a small quantity of paraffin in water, and with sprinkling ash soaked in paraffin. Barley-awns soaked in the same I found kept off the slugs to a great extent, the sharp points making progress difficult for them. The abundance of both snails and slugs this spring after the severe winter ought surely to dispel the popular notion that cold weather destroys molluscs and insects. The worst slug attacks have nearly always come after hard winters. No doubt this is largely due to their natural enemies, the Blackbirds and other birds, being killed, and to these "farmers' friends" being unable to attack them when the ground is hard and covered with snow.

THE MAMMALIAN FAUNA OF CHESHIRE.

By T. A. COWARD AND CHARLES OLDHAM.

(Continued from p. 176.)

Order UNGULATA.—Family BOVIDÆ.

Bos taurus, L. ; Wild White Cattle.—A domesticated herd of the old British Wild White Cattle is still kept at Somerford Park, near Congleton, the seat of Sir Charles W. Shakerley, Bart. Accounts of this herd are given in Storer's 'Wild White Cattle,' in Harting's 'Extinct British Animals,' 1880, and in the Report of the Manchester Meeting of the British Association in 1887 (pp. 135-145), from which sources much of our information has been derived. The cattle cannot be traced here for more than two hundred years, and were probably brought in the seventeenth century from Middleton Park, Lancashire, though it is possible that they may have been at Somerford since the park was originally enclosed. In June, 1887, the herd consisted of thirty animals, which had increased to forty on July 28th, 1894, the date of our last visit, when the numbers were made up as follows:—1 bull, calved in June, 1891; 14 cows; 15 head of young stock, including 3 bulls; 10 calves. The bull is a short-legged, massively built animal, with a very broad, thick-set head and heavy fore quarters. The hind quarters, as in the other herds of park cattle, are lighter than in the ordinary domestic breeds. He has hardly as much black as is usual in this herd. The poll is white, and there are no black hairs in the tail-tassel nor on the fetlocks. There are a few underlying blue spots on the shoulders and flanks, and some scattered black hairs on the sides of the face. The ears are black inside, and for about half their length from the distal end outside; the muzzle, hoofs, and eye-rims are also black. The roof of the mouth and upper surface of the tongue are black; the under-surface of the tongue flesh-coloured. A calf of the Chillingham herd, which Oldham examined in May, 1891, had the tongue similarly coloured. In December, 1887, the two oldest bulls at Somerford had black polls, and a good deal of black about the fore legs and shoulders. The cows vary much. Some are quite white, even to the ears, while others are flecked and spotted with black in varying degrees. In December, 1887, there was one old cow, a blue roan in colour; and others were so profusely

marked with black that at least one-third of their hides was of that colour. One of the young beasts has square-tipped ears, a character which originated from a cross with a bull from the Marchioness of Lothian's herd at Blickling, about the year 1876 or 1877. None of the cattle have red points, and any which are not correctly marked at birth are killed as calves. In December, 1887, one of the calves had chocolate-coloured ears, which were probably inherited from a bull from Mr. A. Cator's herd at Woodbastwick, received in exchange about the year 1879.



Prior to that date red and brown ears were unknown. Black calves are rare. In winter the cattle, especially the bulls, develop long hair on the poll and neck, which divides along the central line, and covers them like a mane. The udders are as large as ordinary domestic cows' and present a striking contrast to those of the Chillingham, Chartley, and Cadzow animals, which, of course, are never milked. The teats are black in some cases, white in others. The herd is a polled one, but one heifer has a pair of well-developed horns, which are black-tipped and up-standing like the Chillingham type. This animal was noticeably wilder and more difficult to approach than the others. The cows are regularly milked, and we can testify to the excellence of the

milk and butter, which have the reputation of being second to none in the county. A yield of twenty-four quarts per diem is not unusual; and one cow is stated, on the authority of Mr. J. Hill, to have yielded the extraordinary quantity of thirty-three quarts per diem, but the drain on her constitution proved fatal in about four months, in spite of everything that could be done in the way of feeding. No steers are raised, all surplus bull-calves being fed for veal. The cattle when fattened for beef weigh up to fifteen scores to the quarter, and the meat is said to be excellent both in quality and flavour. The calves, as we have also observed as Chillingham, Chartley, and Cadzow, are even of a more snowy white than the adults. Though wild at first they soon become tractable, but, if allowed to run in the park soon after birth, they are not easily reclaimed. During winter the cows are housed at night, and supplied with hay, meal, and potatoes; no turnips are given on account of the flavour they impart to the milk. The cattle have the run of about 180 acres of the park, which consists of fine upland turf sloping down to the river Dane. In dry summers, when the river is low, cattle have crossed both ways, but calves of the park cows are kept, if correctly marked, even when the presumptive sire is an ordinary bull. The whole herd will sometimes gallop to a pond in their enclosure, and enter the water till little but their heads remains visible. In concluding our notice of this herd we wish to acknowledge our indebtedness to Sir Charles Shakerley and his agent, Mr. J. Hill, through whose kindness and courtesy we were afforded every facility for examining the cattle, and obtaining the photograph here reproduced.

The cattle which had been kept for centuries in Lord Newton's park at Lyme ceased to exist in 1885. When Coward saw them, in 1884, there were only three animals left, and owing to too close breeding and other causes the herd had been in a declining state for some years prior to that date. An unsuccessful attempt was made to perpetuate the herd by the infusion of new blood in the shape of a bull which was obtained from Chartley about the year 1871. The Lyme cattle, which were larger than those of any of the existing park herds, were white with black muzzles and hoofs, and frequently had some black on the fore legs; the ears were black or red, and occasionally white; the horns yellow tipped with black. In the ferocity of their

disposition and their untamable nature, as well as in many of their habits, these cattle resembled those of the more widely known Chillingham herd. Further and more detailed accounts of the Lyme cattle have been given by Storer (*op. cit.* pp. 245-253), Mr. A. H. Cocks (Zool. 1878, pp. 277-279), and Chas. Oldham (Zool. 1891, pp. 81-87). The following account is given by Storer (*op. cit.* p. 111) of a herd which formerly existed at Vale Royal, near Northwich:—"Here was an ancient domesticated herd of white cattle with red ears, which, though now crossed out and extinct, was kept up, partially pure only, in the time of the late Lord [Delamere]. They are supposed to have belonged to the Abbey; and a singular tradition, the truth of which the late Lady Delamere believed she had verified, was prevalent, to the effect that some of Cromwell's troopers drove off most of them, but that one cow, after having been driven with the rest seven or eight miles, escaped from them and returned home. They were white with red ears, and were in all probability derived from North Wales, as from thence the original monks of Vale Royal came."

Family CERVIDÆ.

Cervus elaphus, L.; Red Deer.—Remains of this species have been found in the bed of the Manchester Ship Canal at Wallasey, Rostherne Mere, and elsewhere, and there is abundant documentary evidence to show that it was formerly common in the Cheshire forests. At the present time herds of Red-deer exist in three parks in the county. In Lord Newton's park at Lyme there are about 170 head of rather small but stoutly-built deer, and there is little doubt that they are the descendants of those originally emparked. The average weight of the stags in this park is 220 lbs., and the hinds 120 lbs. From 80 to 90 head are kept in Lord Egerton's park at Tatton; and about 30 head at Doddington, the seat of Sir Henry Delves Broughton, Bart. (see Whitaker, 'Descriptive List of the Deer Parks and Paddocks of England,' 1892, pp. 28-32). Mr. J. E. Harting writes:—

"In your account of the Red-deer which are maintained at the present time in Cheshire parks, I think it would be of interest to refer to a curious custom which was observed in the last century at Lyme. In this park, 1700 acres in extent, the deer in summer time used to be collected in a herd and driven across a pool before the house, in order that while swimming they might be the more

easily counted. A scarce print of this, of which I am fortunate enough to possess a copy, was published in 1745. It is engraved by F. Vivares from a painting by T. Smith, and measures, without the margin, $20\frac{1}{2}$ in. by 15 in. The inscription is, 'A view in Lyme Park (with that extraordinary custom of driving the stags), the property of Peter Legh, Esq., to whom this plate is inscribed by his most humble servant, T. Smith.' In the middle distance the deer are seen swimming the pool, their heads only above water; in the foreground three have landed, two of which, rearing upon their hind legs, are playfully striking at one another with their fore feet; on the further side of the pool Mr. Legh and his lady, mounted on horseback and accompanied by the park-keeper, Joseph Watson, also mounted, are contemplating the scene, while beyond them we get a glimpse of the great vale of Cheshire and Lancashire extending to the Rivington Hills in the far distance.

"How long this custom continued to be observed I know not, though the present owner of the park might be able to say; but we may assume that it survived, at all events, until the death of the park-keeper, Joseph Watson above named. It is recorded on a monument at Disley that the art of driving the deer was first perfected by him, and that he died in 1753, at the age of 104, having been park-keeper at Lyme more than sixty-four years. Shirley, who mentions this circumstance in his 'Account of English Deer Parks' (1867, p. 207), adds that Watson once undertook, at the bidding of his master, to drive twelve brace of stags to Windsor Forest for a wager of 500 guineas, which he performed accordingly.

"This custom, however, of driving the deer was not confined to Lyme Park, as may be gathered from Dr. Whitaker's remarks concerning Townley, the seat of a collateral line of the Legh family in the adjoining county of Lancaster. See Ormerod's 'Cheshire,' vol. ii. p. 339.

"Playford also, in his 'Introduction to the Skill of Music,' 1655, referring to the fondness of deer for musical sounds, relates that, travelling some years previously in Cambridgeshire, he met on the road near Royston a herd of about twenty bucks, which were following a bagpipe and violin, and in this manner, he says, they were brought out of Yorkshire to Hampton Court. Long before that date, however, Edmund Bert, in his 'Treatise of

Hawks,' 1614, had written:—'Have not wilde stags by watching and manning been driven like cattel upon the way? What is it that man cannot effect if he will thereunto apply himself.'"

Cervus dama, L.; Fallow Deer.—Such works as Ormerod's 'History of Cheshire' contain many references to this species, which was abundant in mediæval times. Mr. J. Whitaker (*op. cit.*) mentions ten parks in which herds of semi-domesticated Fallow Deer are now kept, *viz.*:—Tatton (Lord Egerton), 500 to 600 head; Eaton (the Duke of Westminster), 300; Oulton (Sir Philip Egerton), 250; Cholmondeley (the Marquis of Cholmondeley), 200; Carden (Mr. J. H. Leche), 160; Doddington (Sir Henry Broughton), 150; Adlington (Mrs. Legh), 70; Dunham (the Countess of Stamford), 70; Lyme (Lord Newton), 35; Beeston (Lord Toller-mache), 20.

Order CARNIVORA.—Family CANIDÆ.

Canis vulpes, L.; Fox.—Strictly preserved throughout the greater part of the county, and consequently a great pest to the game-preserved and farmer. On the Longdendale moors Foxes are very destructive to the brooding Grouse, and, as the country is not suitable for hunting, great numbers are killed by the game-keepers. Between thirty and forty were destroyed on these moors in the winter of 1893–94.

In 1890 a vixen reared her litter on an island in Chapel Mere, Cholmondeley Park, Malpas, and was obliged to cross more than twenty yards of water each time she fed her family. When the cubs were old enough to leave their dam she was seen to swim to the shore, carrying them one by one in her mouth (C. Macdona, 'Field,' July 26th, 1890, p. 160). Mr. R. Newstead (*in lit.*) refers to the Fox's partiality for eggs, and states that he has known eggs to be carried away and buried in the earth without being broken. In the accounts of the Chapel-wardens of Holmes Chapel we find that in 1717 and 1722 one shilling was paid for a Fox's head to Joseph Allen (T. Worthington Barlow, 'A Sketch of the History of the Church at Holmes Chapel, Cheshire,' 1853).

Family MUSTELIDÆ.

Martes sylvatica, Nilsson; Marten.—Practically extinct in Cheshire. Byerley records two. The first was killed early in the forties, in the township of Whitby, by a gamekeeper (Robinson), in the service of the Marquis of Westminster. The second, trapped at Hooton in Wirral a few years later, was sent to Mather, the

Liverpool taxidermist, for preservation, by Sir Thomas Stanley. The late J. F. Robinson recollected, as a boy, seeing one which was trapped in the Royalties, near Frodsham; and saw another treed by the foxhounds at Eddisbury Hill, in Delamere Forest ('Manchester City News,' Feb. 9th, 1884, quoted in Zool. 1891, p. 452). Mr. R. Newstead (*in lit.*) states that a Marten was killed in 1876 in some farm-buildings at Hassal, near Sandbach, but was not preserved. He has been informed, on what he considers to be trustworthy evidence, that another was seen in the spring of 1882, on a farm at Thornton-le-Moors. Our latest and most interesting record is in Mr. Newstead's list, and refers to a Marten which was shot in the pheasant-field at Eaton Park on July 7th, 1891, and is now in the Grosvenor Museum, Chester.

Mustela putorius, L.; Polecat; Fomart; Fitchet. — Though the Weasel and Stoat still hold their ground, in spite of incessant persecution, the Polecat is practically extinct in Cheshire. To the present generation of gamekeepers and farmers the animal is almost unknown, and the older men remember it only as having occurred in their youth. The Rev. C. Wolley-Dod, of Edge Hall, Malpas, states (*in lit.*) that during a twenty-five years' residence in the county he has never heard of a Polecat. Colonel Dixon, writing from Astle Hall, Chelford, says he has heard of none during recent years. Captain W. Congreve, of Burton Hall (Wirral), states (*in lit.*), "Some fifty years ago we often caught Fitchets in steel-traps, but none exist here now." Byerley speaks of the Polecat as "occasionally found in Wirral; formerly common." Mr. Newstead's list contains no Cheshire records. In the 'Manchester City News' for June 10th and 17th, 1882, the late J. F. Robinson gave an account of a hunt in Delamere Forest, in which he took part, about twenty years before that date; but the Polecat appears to be quite extinct in that district now. Mr. H. H. Corbett, of Doncaster, states (*in lit.*) that he saw a Polecat in a "keeper's museum" at Bramhall some time between 1866 and 1870, and that he found a half-grown example in a trap at the same place about the same time. Mr. H. P. Greg, of Handforth, writes, under date May 24th, 1894:—"Our old keeper, Brown (who died ten or twelve years ago), killed a Polecat within half a mile of this house, in the Ringway direction, thirteen or fourteen years ago; and our present keeper, Joshua Pearson, killed one just on the Mobberley

side of Burley Hurst four years ago." The Rev. J. E. Kelsall's note (Zool. 1893, p. 102) appears to refer to one of these two, but there is a discrepancy in the dates. We have examined a specimen in the possession of Mr. Alfred Salmon, which was killed in the Bollin Valley, near Bowdon, about five years ago. In the early part of the present century the Polecat was hunted regularly at night by a scratch pack of dogs in the neighbourhood of Northenden and Baguley, and Mr. Thomas Worthington, of Wythenshawe, informs us that an old farmer at Gatley once showed him a small bell, which was hung round the neck of the leading dog, and which he treasured in memory of many nights' sport in which he had participated. Mr. Worthington states that no Polecats have been seen on the Wythenshawe Estate, near Northenden, since the year 1856, when one was caught in a rabbit-trap.

M. vulgaris, Erxl.; Weasel.—Common and generally distributed. This species is usually reported by gamekeepers to be less common than the Stoat, but this is probably owing to the fact that it seeks its food principally in the runs of Voles and Field-mice and the galleries of the Mole, whereas its larger congener preys upon rabbits and game, and is therefore more frequently taken in the keepers' traps. Mr. Newstead, however, says (*in lit.*) that in the neighbourhood of Chester the Stoat is certainly the commoner species.

M. erminea, L.; Stoat.—Common and generally distributed. The Stoat is often called "Foumart" in Cheshire. Examples in the white winter pelage are frequently taken on the hills of the eastern border, and are by no means rare on the Cheshire plain. All that we have seen, however, retained a few patches of brown hair on the face and shoulders.

Meles taxus (Schreb.); Badger; Brock.—The Badger is by no means extinct in Cheshire, and is even common in certain districts. In Wirral it appears to be rare. Byerley mentions one that was killed near Hooton about the year 1848, and states that many years prior to the date of his list examples had been obtained at Oxton Hill, Caldy, and Moston Hall, near Chester. Captain W. Congreve informs us (*in lit.*) that one was shot near Burton in June, 1893. Mr. Newstead says:—"Thirty years ago this fine animal was common in Delamere Forest, on the Manley side of which there must have been a large colony of them, as traces of their burrows still remain, and the place is called

'Boger Bonk' (Badger Bank) by the natives to this day. About the year 1885 a very old specimen was taken in the above locality by some poachers." He also records examples from Broxton (1885 and 1892), Eaton Park (1887), and Oulton Park (1888); and informs us (*in lit.*) that Lord Arthur Grosvenor obtained one at Broxton in March, 1894; and that one, which was sent alive to the Grosvenor Museum, Chester, was dug out by the Hon. Cecil Parker at Cotton, near Waverton, in May, 1894. Another example was seen at the same time, but not obtained. The Rev. C. Wolley-Dod, of Edge Hall, Malpas, states (*in lit.*, Aug. 28th, 1893), "Badgers are common in the woods in this part of the county"; and we are informed that they may still be seen occasionally at Tushingham-cum-Grindley, in the same district. Colonel Dixon, of Astle Hall, Chelford, writes on March 16th, 1894:—"Within the last few years Badgers have become very plentiful about here. Three or four years back my keepers shot one, and I have seen two that have been killed within the last few years by trains on the railroad; they and the Foxes seem to live amicably together, often in the same holes, but they make a great mess in the coverts where they have their earths, as the soil here is so sandy." At Lower Peover one was dug out in the autumn of 1891 or 1892, and was kept alive for some weeks by a fishmonger in Knutsford. In the 'Manchester City News' for Oct. 28th, 1893, an anonymous writer states that several Badgers have been taken during recent years at Minshull Vernon, near Middlewich. Badger Clough, near Disley, and Badger Bank Farm, near Peover, may be cited as place-names connected with the present species. Dr. H. Colley March, of Rochdale, informs us that Brock is known to have been a personal name in Cheshire as far back as 1577, and suggests that Broxton was the stead or enclosure of the man Brock rather than of the animal from which his name was derived.

Lutra vulgaris, Erxl.; Otter.—The Otter is still fairly plentiful in the Cheshire streams and meres, and is even taken sometimes in the polluted waters of the manufacturing districts. One, killed in the river Tame at Reddish Vale on Sept. 14th, 1890, is preserved in the Vernon Park Museum, Stockport. At the present day it is rare in Wirral, and the increased traffic will account for its disappearance from the tidal waters of the Mersey; but it still holds its own, in spite of persecution by fishermen, in such

streams as the Dee, Weaver, Gowy, Bollin, and Dane, and in many of the meres. An adult female was killed by an express train near Balderston, Chester, on Feb. 24th, 1894 (R. Newstead, *in lit.*). In February, 1886, an unusually large Otter, weighing 30 lbs. and measuring $48\frac{1}{2}$ in., was killed in the Weaver at Wrenbury (F. V. Starkey, 'Field,' Feb. 20th, 1886).

Family PHOCIDÆ.

Halichærus gryphus (Fab.); Grey Seal.—There is a specimen of this Seal in the Brown Museum, Liverpool, which was captured in the Canada Dock in the winter of 1860-61 (T. J. Moore, 'Report ii., Liverpool Marine Biology Committee,' p. 136).

Phoca vitulina, L.; Common Seal.—Byerley states that the Common Seal has occasionally been captured in the Dee and Mersey. Moore never had an opportunity of examining a local specimen, and does not include it in his list of the Seals and Whales of Liverpool Bay; but the majority of the Seals which have been observed in the district from time to time probably belong to this species. There is a specimen in the Warrington Museum that was shot by William Mather at the mouth of the Gowy (Charles Madeley, *in lit.*). The stuffed skin of another specimen, which frequented one of the sandbanks near Hilbre Island for some time during the winter of 1893-94, is preserved in a fishmonger's shop in Liverpool (Dr. Herdman, *in lit.*).

Cystophora cristata (Erxl.); Hooded Seal. — A Hooded Seal was captured on the Mersey shore, at Frodsham, on Feb. 3rd, 1873, and was exhibited alive in Widnes. It is now preserved in the Brown Museum, Liverpool (T. J. Moore, *loc. cit.*, p. 137).

(To be continued.)

OBSERVATIONS ON BIRDS IN MID-WALES.

By J. H. SALTER.

(Continued from p. 184.)

LIMICOLÆ.

CURLEW, *Numenius arquata*. A few upon the coast and many in the Dovey through the winter. Often noisy after dark in March, when they are probably passing inland to the hills. By the end of that month they have reached their breeding quarters, and are scattered rather locally over the hills, preferring bog-

land. Numbers also nest upon the low-lying Borth and Teifi bogs, whilst those nesting in the hills fly to the Dovey to feed at low tide. Upon the bogs they may be seen to mob Carrion Crows with much spirit, mounting above them and stooping almost in the style of a Hawk. Though most of the eggs are hatched by May 20th, a young one which I caught could barely fly on June 30th.

WHIMBREL, *N. phaeopus*. The spring passage begins with great regularity within a day of the 3rd of May, and lasts through the greater part of that month; while in 1894 I heard the note as late as June 21st. Few or none are seen on their return passage in August.

BAR-TAILED GODWIT, *Limosa lapponica*. Used to be plentiful in the Dovey, but its numbers, like those of all the migratory waders, have fallen off. Still seen at times in good large flocks in August and September. Mr. F. T. Fielden only saw two in 1894.

BLACK-TAILED GODWIT, *L. aegecephala*. One only, an immature bird, in the possession of Mr. F. T. Fielden.

GREENSHANK, *Totanus canescens*. Small parties of not more than four are seen fairly frequently on the Dovey in August. Mr. F. T. Fielden has seen a Greenshank at one of the lakes in the hills in April or May.

WOOD SANDPIPER, *T. glareola*. Capt. G. W. Cosens has a specimen which he obtained at Glandovey.

REDSHANK, *T. calidris*. A few in the Dovey and Barmouth river, but more numerous about the muddy inlet at Mochras Island, near Harlech. It may breed there, as I saw a flock of twenty-five on July 2nd, 1893.

GREEN SANDPIPER, *Helodromas ochropus*. Mr. F. T. Fielden has seen one at the same spot for several years upon the Dovey. One shot at Clarach is preserved at Gogerddan.

RUFF, *Machetes pugnax*. Only two occurrences. One was shot by Mr. Hooton near Borth; the other preserved by Mr. Hutchings.

COMMON SANDPIPER, *Totanus hypoleucus*. Breeds upon all the hill-streams and beside the llyns. Arrives with great punctuality, generally on April 22nd. On May 31st, 1893, sitting had not begun, as the birds were still in pairs, the males trilling and tripping about with both wings raised vertically, or with one held up flag-wise. Young birds frequent the Ystwyth in August.

SANDERLING, *Calidris arenaria*. Large flocks visit the Dovey in August, and are seen again, often with Ringed Plover and Dunlin, in April and May. A few may stay the winter, as I saw one on Jan. 9th, 1893.

LITTLE STINT, *Tringa minuta*. Occurs now and then upon the Dovey about the end of September. Mr. F. T. Fielden, who has specimens, saw two in 1894.

PURPLE SANDPIPER, *T. striata*. Met with every winter, singly or in pairs, but is far from numerous.

DUNLIN, *T. alpina*. Common on the Dovey through the autumn and winter, remaining till April or May. A very large flock, with Ringed Plover, seen on May 26th, 1893, may have consisted of non-breeding birds. Nests in some numbers on the Teifi Bog, where, as already recorded, I found eggs on May 13th, 1893. Others seen during May and June about the margins of some of the lakes in the hills were evidently nesting in the vicinity.

CURLEW SANDPIPER, *T. subarquata*. Occurs on the Dovey, usually in September, its numbers varying from year to year. In 1891, or the previous year, Mr. F. T. Fielden obtained a number, and saw one flock of from twenty-five to thirty.

KNOT, *T. canutus*. Large flocks sometimes come to the Dovey for a short time during the first three weeks of September, but its visits are very uncertain. There is one in summer plumage at Gogerddan.

WOODCOCK, *Scolopax rusticula*. Common, but I have failed to hear of any instance of its breeding. At Peniarth Mr. F. Abel flushed four from under a single bush.

GREAT SNIPE, *Gallinago major*. Not very uncommon. Mr. Hutchings has preserved at least three. Capt. G. W. Cosens has an example which was obtained in September, 1891. A specimen at Gogerddan is mounted so as to show the large amount of white in the tail.

COMMON SNIPE, *G. cœlestis*. Breeds sparingly in the hills, but plentifully upon the Teifi Bog. Here at dusk the air seems full of its bleating and buzzing.

JACK SNIPE, *Limnocryptes gallinula*. Fairly numerous.

GREY PHALAROPE, *Phalaropus fulicarius*. Occurs in autumn when driven out of its course while on passage. Mr. Hutchings received seventeen after rough weather between Oct. 15th and 24th, 1891. Mr. F. T. Fielden has met with it twice at Borth.

TURNSTONE, *Streptilas interpres*. About the first of the waders to arrive from the North, coming during the first week in August. They pass on almost at once. A few have been obtained in full summer dress.

LAPWING, *Vanellus cristatus*. Breeds very sparsely in the hill-districts, seeming to prefer fallows and the sand-links of the coast.

GREY PLOVER, *Squatarola helvetica*. Visits the Dovey in decreasing numbers, generally at the end of August or beginning of September.

GOLDEN PLOVER, *Charadrius pluvialis*. Breeds very sparsely on the slopes of Plynlimmon, and in other parts of the hill-district; more plentifully upon the Elan Moors, near Rhayader. Occurs at Aberystwyth during rough winter weather. Visits the Dovey from September to May, large flocks usually arriving there with the first snow; but if frost continues they soon leave. They are generally very wild.

DOTTEREL, *Eudromias morinellus*. Mr. Hutchings informs me that a Dotterel was shot by the late Mr. Richards, of Penglais, Aberystwyth, upon the Bryn-y-môr fields.

RINGED PLOVER, *Ægialitis hiaticula*. Very numerous as a breeding species along the greater part of the Merionethshire coast, and about the warren at Borth, south of which point the coast is unsuitable, and only an occasional pair is to be found. Last year but few had arrived on April 9th; the majority were still in flocks on the 30th, laying not being general till the middle of May.

OYSTERCATCHER, *Hæmatopus ostralegus*. Breeds commonly on the beaches and warrens of the Merionethshire coast, and to within about a mile of Borth. Scattered pairs nest at intervals along the Cardiganshire coast upon rocky points, islets, and stacks. Non-breeding birds are seen in flocks all through the nesting season.

CREAM-COLOURED COURSER, *Cursorius gallicus*. The example obtained at Ynyslas, near Borth, in Cardiganshire, by Mr. Horton, in October, 1886, has been sufficiently recorded (see 'Zoologist,' 1887, p. 269).

(To be continued.)

NOTES AND QUERIES.

MAMMALIA.

The proper Specific Name of the Weasel.—The editorial note appended to my remarks on this subject obviously demands an immediate reply, for the question at issue is particularly one which should be settled as soon as possible. Every one will agree that the proposed change of name "ought not to be too hastily accepted," and feeling this I have pondered on the subject, off and on, for about a dozen years, in the vague hope that the obvious suggestion as to Linnæus's "*Mustela nivalis*" being a small female Stoat might turn out to be correct. Such drifting on, however, is one of the main causes of the present confusion in zoological nomenclature, and the sooner such a question is cleared up the better. In deference to those who may think that long usage of a name has a bearing on the question whether it be the correct name to use, it may first be pointed out that such "use" should be sole use, which is not the case in the present instance. On the contrary, nearly every Scandinavian naturalist of repute has actually used *nivalis* for the Weasel, while (which is vital) those who have not, have all without exception put *nivalis* (or at least "snömus") among its synonyms. And this is equally the case with other continental naturalists, not excepting Blasius, whose volume on European mammals remains the standard work on the subject. In fact, with the exception of the Editor, I have failed to find one single writer who seriously considers *nivalis* to be a synonym of *ermineus*. But the real question is not that of the name *vulgaris* having been "120 years in use," but whether the characters given by Linnæus best fit the female Stoat, as suggested by the Editor, or the Weasel in its winter dress. As the Swedish Weasel must of course be mainly considered, I extract the following from Prof. Lilljeborg's 'Sveriges och Norges Ryggradsdjur,' the latest and best work on the subject (vol. i. p. 508):—"Äldre individer hafva i denna dräkt icke sällan några på svartaktiga hår i yttersta svansspitsen": that is to say, "Old individuals [of "*Mustela nivalis*"] have in this [winter] dress not infrequently some few blackish hairs at the extreme tip of the tail"; and words to the same effect occur in other diagnoses of the species. Can anything better correspond to Linnæus's account, quoted by the Editor, "caudæ apice vix pilis ullis nigris"? Even in Britain occasional specimens of the Weasel occur with black tips to their tails, a fact which such a student of British mammals as the Editor might have been aware of. As to changing white, the Weasel throughout the northern portions of its continental range habitually turns to white every winter. The name *nivalis* I have always supposed to have been a latinization of the Swedish *Snömus*, a colloquial term quoted by every Scandinavian writer;

but Mr. Harting is no doubt right in saying that Linnæus may also have been influenced by the colour. No one can lament the necessity for changing familiar names more than I do; but I feel perfectly convinced that the sooner we boldly make such changes as are demanded by the laws of priority, the sooner we shall attain stability in nomenclature. I do not quite understand the meaning of the last paragraph of the editorial note about the transference of the Weasel from the genus *Mustela*, in which Linnæus placed it, to the genus *Putorius*. *M. martes* was the type of the genus *Mustela*, of which the first division was made by Cuvier, who gave the name *Putorius* to the Stoats and Weasels; but I do not know whether we are to infer from the editorial that Mr. Harting considers the Martens and Weasels to be congeneric. If not, I cannot understand his objection, as presumably he would sanction the transference of the Otter from the genus *Mustela*, in which Linnæus placed it, to the genus *Lutra*, and the same with the Badger and the rest.—OLDFIELD THOMAS.

[If it be the fact, as stated, that the Weasel occasionally has a black tip to the tail, or at least black hairs in the tip of the tail, and also habitually turns white in winter throughout the northern portion of its continental range, it is, of course, possible that Linnæus's description of *Mustela nivalis* may apply to the Weasel, instead of to the Stoat as most people would naturally infer on reading the diagnosis; but the point being in doubt, we should prefer to leave the specific name of the Weasel, *vulgaris*, unchanged. In the course of thirty years' experience (1865—1895), after shooting in almost every part of the British Islands, and examining the vermin killed and hung up by gamekeepers, we have never recognized a Weasel with any conspicuous black hairs in the tail; and the very few white ones we have seen were albinos, not necessarily killed in winter. As to the removal of the Weasel from the genus *Mustela*, naturally, we now-a-days regard the Martens as generically distinct from the Weasels and Stoats; but as the late Mr. Alston, whom Mr. Thomas professes to follow (p. 177), placed the Martens as Nilsson did, in the genus *Martes*, as other writers have done before and since he wrote (P. Z. S., 1879, p. 468), we should have been content to leave them there.—ED.]

The Irish Stoat in the Isle of Man.—It will interest all students of British Zoology to hear that a specimen corresponding in every respect with typical examples of *Putorius hibernicus* has been presented to the British Museum by Mr. P. M. C. Kermode, of Ramsey, who had received it from Lewaigue, near that town. This fact confirms Mr. Kermode's view (Zool. 1893, p. 61), that the Manx fauna is more nearly related to that of Ireland than that of Britain, although it should be confessed that the Hare found there (also sent by Mr. Kermode) is the Brown and not the Alpine Hare. It now becomes more important than ever that Stoats from the parts of Britain nearest to Ireland should be properly examined; and

specimens from the south-western parts of Scotland, Galloway, the Lake region of Cumberland, Anglesey, Cornwall, and the Scilly Islands, will be most gratefully accepted. Should Stoats from any of these localities show an approach to the Irish form, it will render it probable that the latter should be looked upon as a geographical subspecies, well marked in its own locality, but grading elsewhere into another form. No British specimens as yet seen, however, have shown the smallest tendency to such approach.—**OLDFIELD THOMAS** (Natural History Museum).

Bank Vole in Bedfordshire.—I have often noticed Voles frequenting hedgerows in Bedfordshire that I suspected were of this species, and in April last, whilst spending a few days in that county, I was able to confirm my views by trapping several specimens in different localities.—**J. S. ELLIOTT** (Dixon's Green, Dudley).

Food of the Bank Vole.—*A propos* of the remarks on this subject by Mr. Teesdale (p. 186) I may mention that, in the autumn of 1869, during a short visit to Hampshire, I noticed in the cornfields near Alresford a number of heaps of the carpels of *Ranunculus repens*, many of which contained a good handful. All the carpels had a minute semicircular piece bitten out of the margin. In every instance of the many I examined the seed had been extracted, and although the sides of the carpel had obviously been opened, they were not separated from each other, but had firmly come together again. I had no doubt that the seeds had been eaten by mice, but could not determine to what species they belonged. The exceeding delicacy of this operation seemed to indicate that it was one of the smaller kind, *e. g.*, the Field Mouse, but there were no holes of these in the immediate vicinity of the heaps, which were most numerous near the outside of the field. It is possible that they were brought together by the Bank Vole, but it seems unlikely that it would eat such small seeds, or that it would deal so cleverly with them. It would be interesting if some resident in that district could solve the question.—**JOHN LOWE** (4, Gloucester Place, Portman Square).

BIRDS.

Rooks in London.—Some time ago I had to report (Zool. 1889, p. 27) the almost total disappearance of Rooks from the West End of London. I think I may now state that they have not quite deserted that part of London, although their behaviour has been somewhat erratic. The birds left Kensington Gardens for the simple reason that their nesting trees were cut down. They resented the insult, and though there were plenty of available trees close by, they forsook the locality until 1892, when a solitary nest was built in the south-western corner of Kensington Gardens. In the following year, however, a strong colony took up their quarters in the trees bordering the Bayswater end of the Broad Walk, that is, the north-western

corner of Kensington Gardens. There were some fifteen or sixteen nests; at the same time some eight or ten nests were built in Connaught Square; five in Stanhope Place; and two in a plane-tree in Albion Street. When I saw this I quite thought that the re-establishment of the Rook at the West End was a *fait accompli*; but, alas, it was not so. In 1894 the birds returned to their breeding-place in Kensington Gardens, but when they had partially built their nests they suddenly disappeared, and the site was absolutely deserted and has not since been re-occupied. At the same time (1894) Albion Street and Connaught Square were deserted. I can, however, state that the little colony at Stanhope Place this year consists of *three* nests, and there are five nests in Connaught Square.—JOHN YOUNG (64, Hereford Road, Bayswater).

Food of the Firecrest and Little Bustard.—A female Firecrest, *Regulus ignicapillus*, which I dissected last October, had been feeding on minute beetles. A little Bustard, *Otis tetrax*, contained a great quantity of larger beetles and grasshoppers, in addition to what appeared to be the tops of turnips.—HUGH A. MACPHERSON (Carlisle).

The Food of Woodpeckers.—The nature of the food of American Woodpeckers has been investigated by Mr. F. E. L. Beal from an examination of more than 600 stomachs. He has found that the Hairy and Downy Woodpeckers (*Dryobates villosus* and *pubescens*) feed chiefly on harmful insects, eating also wild fruits and seeds. The Flicker (*Colaptes auratus*) subsists largely on ants, of which insects more than 3000 were contained in each of two stomachs. This species also eats other noxious insects and some wild fruit. The food of the Red-headed Woodpecker (*Melanerpes erythrocephalus*) is largely insects, nearly all harmful, with wild fruit and some corn and cultivated fruit. The Yellow-bellied Woodpecker, or Sapsucker (*Sphyrapicus varius*), feeds largely on the inner bark and sap of trees, eating also ants and other insects, and is the only species taking more vegetable than animal food.

Crossbill feeding on Insects.—In 'The Zoologist' for 1890 (p. 414), a reference will be found to the common Crossbill feeding on aphides. In May of the present year four adult Crossbills were brought to me, which had been shot out of a large flock. On dissecting these birds I found that they had been feeding upon small flies and minute beetles, in addition to the seeds of a conifer. The insects in question were numerous represented.—H. A. MACPHERSON (Carlisle).

Cuckoo's Egg in Wren's Nest.—In the early part of May I found a Cuckoo's egg in a Wren's nest. The nest was placed in the usual position—beneath the matted and exposed roots of a tree in the channel of a water-course. The egg did not sufficiently assimilate those of the Wren to be remarkable; but there was a curious zone of a lighter colour than the rest

of the egg round the middle, and a darkening of the smaller end, which were noticeable. Strangely enough, when passing the spot some three weeks later, I found another Wren's nest within a few yards of the former one, in which was another Cuckoo's egg in addition to three of the rightful owner. Being somewhat curious to ascertain whether there was any peculiarity in the two Cuckoo's eggs which would indicate their common parentage, I took the second specimen home and compared it with the other, with the result that I found an almost perfect uniformity both in size and colour. Now, however doubtful be the significance of the former fact, it must be admitted that the latter is at least suggestive; as, although the eggs of different individuals of the same species may be so variable as to render the circumstance of two being found of the same size but a slender basis for identifying them with the same bird, yet the manner in which the colouring matters and markings are disposed furnishes an almost sure test, and I found in each egg the same indefinite zone and somewhat darkened smaller end. Assuming—and there certainly seems no reason to regard the assumption as insecure—that the two eggs were the produce of the same individual, the instance would seem to lend credence to the likelihood expressed in Prof. Newton's 'Dictionary of Birds' (article "Cuckoo," pt. I., pp. 122–124) of individual female Cuckoos only introducing their eggs into the nests of *one particular species*, and not indiscriminately into those of any of the birds usually selected as foster-parents. In the two cases in point, it is certain that the nests chosen for the introduction of the alien eggs were not selected as being the only available or most convenient. Indeed, the insertion of the egg in the former could not have been unattended with considerable difficulty, for it must have been deposited with either the bird's bill or feet without alighting; and the vicinity is one abounding in hedgerows and banks which afford suitable nesting-places for Hedgesparrows and Robins and other dupes of the Cuckoo.—W. C. J. RUSKIN BUTTERFIELD (Stanhope Place, St. Leonards-on-Sea).

Cuckoo's Eggs in Whitethroat's Nest.—On May 28th I found a Greater Whitethroat's nest containing two eggs and one of a Cuckoo's. I took the Cuckoo's egg. Going again on the 31st, I found the Whitethroat had laid one more egg, and had then commenced to sit. This is rather unusual, as the normal number of eggs is generally five. The nest was situated in a hedge at the top of a high bank, bordering a road which was little frequented. I mentioned the fact to Prof. Howes, and he suggested that it might be of some interest to your readers, as a Cuckoo laying in a Greater Whitethroat's nest is of somewhat rare occurrence.—W. LEONARD S. LOAT (Southborough, Tunbridge Wells).

Early Laying of Cuckoos.—Cuckoos seem to me to have laid unusually early this season, and the following dates may therefore be

worth recording. I have, as a rule, commenced to search for the eggs of this species about May 20th, continuing up to about June 10th, and most of the eggs I possess—about eighteen or twenty in all—were taken during the first week in June. To my surprise, however, this year I received a letter from a reliable correspondent residing in Surrey, dated May 14th, saying that he had already taken seventeen Cuckoos' eggs in the neighbourhood of Byfleet, the first having been found on April 30th. On May 25th I found in the ivy over a potting-shed in my garden here a Robin's nest containing a young Cuckoo about a week old, so that the egg from which it was hatched must have been laid quite at the beginning of May; and I also heard of another young bird in this neighbourhood rather older, so that the egg in that instance must have been laid earlier still. The young bird in my garden was discovered by my noticing four young Robins—only just hatched; in fact, one was still in the broken shell—lying on the ground below the nest, and on looking into the nest to ascertain the cause, I found a young Cuckoo in possession: he must have turned his companions out, therefore, almost as soon as he was hatched. From the actions of the birds, I have no doubt that they are still laying as usual, and I am inclined to think that the early eggs were the result of the exceptionally warm weather we experienced this year at the beginning of May.—E. A. BUTLER, Lt.-Col. (Brettenham Park, Suffolk).

Curious fate of a Cuckoo.—I was recently shown the remains of a Cuckoo preserved in such a way as to show the manner in which it met with its death. It is a hen bird, and seems to have been pushing its way into a bush in search of a small bird's nest. It must have used some degree of force, and had thrust its head into the fork of a fairly stout branch, when a more slender twig which had "given" a little, springing back into place, "clenched" the head behind, so that the bird could not withdraw it. When found the bird was dead, and had been hanging for some days.—J. H. SALTER (University College, Aberystwyth).

***Palæornis rosea* breeding in Confinement.**—Late in the summer of 1893 I purchased two pairs of the Burmese Blossom-headed Parrakeet, *Palæornis rosea*, in nestling plumage. They were newly imported, rough in feathering, and their wings had been clipped; consequently I obtained them at a very reasonable figure. In this early stage the young birds are much alike, but the hens are somewhat stouter in build, and their plumage is rather duller than that of the cocks; both sexes, however, unlike *P. cyanocephalus*, have the purplish brown patch on the wing-coverts. Towards spring both males came into colour, but both sexes of one pair which I kept in a heated aviary failed to reproduce the primaries which had been cut off, and died soon after their moult: I then discovered that the bone had been injured by the knife of the native, who had maimed them.

The other pair, which I had turned out into a cold aviary, developed perfectly; and in May the male began to make advances to the hen, which she at first resented; eventually she permitted him to feed her, and he finally succeeded in enticing her into a log-nest suspended in one corner of the aviary. From this time the female bird seldom left the log-nest; the male bird entered from time to time to feed her, and I hoped she had laid eggs and was sitting; but in this I was mistaken, for it was late in June when, weary of waiting for results, I looked into the nest, and discovered two freshly-laid eggs. Early in July, watching my opportunity when the hen was taking a constitutional, I again looked into the nest and discovered a plump naked youngster, which uttered harsh hissing sounds until I covered it up. It left the nest, fully feathered, but with a short tail, on June 26th, able to fly short distances, but extremely nervous about trusting to its wings; the efforts of the parents to induce it to fly were very interesting. By September this young bird was larger than either parent, and called as loudly (the note is not unlike that sometimes produced by a heavy iron gate when very rusty and slowly opened widely); I therefore concluded that I had reared a male; but, as it still retains the greenish grey head of its mother, it seems likely that I was mistaken in this surmise. It is much wilder than its parents, which one would hardly have expected in a bird bred in confinement; but I have noticed in the case of some of our British birds that when reared from the nest by hand they become not only more wild than those caught in traps or nets, but remain permanently so.—A. G. BUTLER (Beckenham).

Jack Snipe in Dorsetshire in May.—On the evening of May 25th I flushed a Jack Snipe close to my feet, in a swamp on Bloxworth Heath. It pitched down again about twenty yards off, but I could not get it to rise a second time. This is the latest occurrence I have ever recorded. In my note-book on 'Birds' I see that on May 6th, 1851, I flushed a pair of these birds in a bog about a quarter of a mile distant from the spot where the one now recorded was found. I had no time on the last occasion to make any effectual search for a nest; in fact the spot where it rose was evidently only one where the bird was just then feeding; but it can hardly be supposed that these birds should be here in May and not breed with us. Some lucky accident will, I suspect, one day prove this to be the case.—O. P. CAMBRIDGE (Bloxworth Rectory).

Song of the Cirl Bunting.—Have any of the readers of 'The Zoologist' noticed that the Cirl Bunting has, in addition to its well-known ditty, which resembles that of the Yellowhammer without the long concluding note, a short and pleasant song sounding like "say, say, see," or "sayo, sayo"; the last note a third higher than the preceding? On one occasion, some years ago, I heard a bird which I believed to be a

bunting, on the wild grounds near Portsmouth. Its song, frequently repeated, sounded like "Tic, tic, tic, wirra, wirra." I could not get very near it, and have never since heard a song like it. It was not a Corn Bunting.—CHARLES W. BENSON (Rathmines School, Dublin).

Nesting Materials used by the Hawfinch.—Whilst examining the materials used in a nest I found situated in the topmost branches of an old crab-tree in Sutton Coldfield Park, I was particularly interested in finding, in addition to the usual dead twigs, fibrous root, and hair, that the nest had been built with a platform of the green leaves of the mountain ash, which could not have been obtained within some 250 yards of the spot. I cannot help thinking that these were used as a protection in screening the nest from observation from below.—J. STEELE ELLIOTT (Dixon's Green, Dudley).

Wood Pigeon nesting on the Ground.—Whilst exploring one of the many little islands on Lough Cong, Co. Galway, I came across a most unusual sight. The island to which I refer is thickly wooded with small firs, oaks, willows, and other trees and shrubs. Round the edges of the wood there was a line of high heather. Wood Pigeons, *Columba palumbus*, were breeding in considerable numbers in the wood; but as I was going round the edge of the island I almost stamped on a Wood Pigeon which rose from out of some high heather. Thinking that this was a curious place for the bird to be feeding, I looked down amongst the heather. In the midst of a thick clump of tall heather was a Pigeon's nest, composed of a few sticks placed literally on the ground. This nest contained one egg, which I have. This seemed very strange, but I thought it must be an accident. On the other side of the island, however, I flushed another Pigeon in the same way, and found another nest in exactly the same sort of position, but this nest contained quite a big young one. There seems no accounting for this curious fact. The birds must have nested in this position by deliberate intent. Yet there were plenty of good trees for their purpose, where other Pigeons were breeding.—HENRY F. WITHERBY (Blackheath).

Nightingale singing in July.—For the first time in my continental experiences, extending over twelve years, I heard the Nightingale sing in July last year, at Royat. We arrived there on June 29th, and at half-past ten p.m. heard its song very plainly from our hotel. The birds were plentiful in the neighbourhood, and continued to sing up to July 15th, when I heard one for the last time, as it sang close to the English church. Royat is an excellent station for ornithologists.—CHARLES W. BENSON (Rathmines School, Dublin).

[When the young are hatched the males leave off singing, and busy themselves in bringing food to the nest. This is generally before the end of the first week in June.—ED.]

Supposed hybrid between Blackbird and Thrush.—During the severe frost last winter a bird was caught in my garden which I at first took by gaslight to be an old hen Blackbird; but a more careful examination by daylight convinced me that there was something odd about it. It had the peculiar flattened crown which, together with a slight frontal depression, gives a frog-like aspect to the Song Thrush and Redwing when viewed from the front; the throat also had an ashy-white appearance suggestive of the Ring Ouzel. The bird, however, probably through inability to wash for several weeks, was so grimy that it was not easy to come to any definite conclusion as to its true colouring. On March 7th I showed the bird to my friend Mr. Frohawk, who agreed with me that there was something very odd about its appearance; we therefore decided to give it a good wash, and thereby ascertain its true colouring: this we did, and when thoroughly dry again we found it in all respects intermediate between Blackbird and Song Thrush. The following is a description, so far as it could be taken from a caged bird:—Upper parts, including wings, tail, cheeks, ear-coverts, and neck, deep smoky-brown; a narrow pale brown superciliary streak from the base of the upper mandible to behind the orbit, and a short moustachial streak from the lower mandible; circle round eye yellow; chin and throat ashy-white, forming a large triangle with its apex on the chin; sides of this triangle washed with brownish buff, and the whole surface traversed longitudinally by parallel irregular mottled dull black streaks, which pass into indistinct spots on the fore-chest; chest and breast rufous-brown, more smoky at the sides; abdomen and vent slightly greyish in the centre, shading into smoky brown at the sides and gradually passing into the more rufous tint of the breast. Bill orange, somewhat paler towards the tip; culmen blackish; feet yellowish horn-brown; iris hazel. Size about that of a Blackbird. I have once or twice found eggs of the Song Thrush deposited in the nest of the Blackbird; but at the time I thought this might have been done designedly by some naturalist trying an experiment (for I have tried such an experiment myself); but Mr. Frohawk on one occasion discovered a nest of this character which was undoubtedly visited by both Blackbird and Thrush. The existence of hybrid Blackbird and Song Thrush is tolerably well established; but I believe most of the birds supposed to represent this cross have been shot, not caught. It will be interesting to discover whether the song of such a bird will partake of the character of that of both parents. The alarm-note is a sharp "chuck," very like that of the Blackbird.—ARTHUR G. BUTLER (Beckenham).

Crossbills in Leicestershire.—On March 15th Mr. Turner, of Market Harborough, received three specimens of the Common Crossbill, *Loxia curvirostra*, a male and two females, which had been killed near that town. The Crossbill occasionally remains in this country during the winter. In

the first week in January, 1852, while I lived in Oxfordshire, I shot two, a male and female, from a small flock which visited our garden. The plumage of the male differed very much from the bright tints of its summer dress; it was of an almost uniform pale red, with darker markings on the side of the head and on the wings; the plumage of the female did not show any marked change. — A. MATTHEWS (Gumley, Leicestershire).

Albino and Pied Varieties.—In February last I had a lovely white Wood Pigeon brought to me, I think the prettiest I have ever seen. There are a few dark feathers in its plumage, but they are hardly visible, and so far as they are noticeable they only serve to accentuate the general appearance of the bird, which is set off to great advantage by its purplish-red feet. It is a welcome addition to our local museum. In the spring of 1894 an albino of the common Whitethroat was brought in, a nestling and a dainty little bird, with pink irides. Mr. Whitaker's note on the pied Hawfinch (p. 72) reminds me that the Italian collection of birds at Florence contains a white Hawfinch. If I remember right, it is of a uniform dull white, with a pale grey chin-spot. Several pied Hawfinches are mentioned in the 'Avifauna Italica' of Professor Giglioli, who has procured many pretty varieties of birds for the Italian collection. The most noteworthy variety that I have seen of late is an example of the common Crossbill, *Loxia curvirostra*, preserved in the public museum at Bergamo. This bird has the head, neck, and breast of a pure yellowish white; the remainder of the plumage is brown and green. I never before heard of a pied Crossbill.—H. A. MACPHERSON (11, Victoria Place, Carlisle).

Ornithological Notes from Yorkshire.—On Feb. 1st several Whooper Swans were observed in this locality. On Feb. 2nd, when driving between Fewston and Darley, I observed three large birds on the moors near to a plantation. Getting within a short distance of them, they proved to be Black Grouse, a male and two females. I was shown, on Feb. 11th, a dead female specimen of the Lesser Spotted Woodpecker which had been found in Dob Park wood. This species is rare in the Washburn Valley. I have only known one instance of its nesting here—viz. in Lindley Wood in 1888. On Feb. 25th an old male Great Spotted Woodpecker was caught in Folly Hall wood. It breeds sparingly in this valley. Mr. J. Yorke, of Bewerley Hall, Pateley Bridge, informed me that, on Feb. 14th, he saw a Waxwing, *Ampelis garrulus*, in a thorn bush on the bank of the Nidd, about a mile above Pateley. It seemed to be in good plumage, and was eating berries greedily; it took no notice of him, though he watched it from a distance of only a few feet. I have never seen or heard of one here in recent years, though we have two in our collection which were killed here many years ago.—WM. STOREY (Fewston Lodge, near Otley).

Winter Notes from the Isle of Man.—On Feb. 23rd last I saw in the hands of Mr. G. Adams, of Douglas, a Red-necked Grebe (*Podiceps griseigena*), which a few days before had been killed at the south of the island, and sent to him for preservation. It had the chestnut colour on the neck well developed, and the cheeks whitish grey. I observed no trace at all of the slight crest of the species. In the Isle of Man, as elsewhere, birds suffered severely at the time of the great snowfall (Feb. 6th), and during the prolonged hard weather before and afterwards. On the day following this fall, flocks of birds of various kinds—Rooks, Starlings, and Chaffinches—sat, as if in a stupefied state, on the trees bordering the main road at Laxey, motionless, and regardless of passers-by and the stir of the village. There has been a perceptible thinning of Blackbirds and other song-birds, but Magpies and Jackdaws, which are very numerous and familiar about this place and its immediate neighbourhood, do not seem to be materially reduced in numbers. On Feb. 18th a male Red-breasted Merganser (*Mergus serrator*), in full plumage, and an adult Sheldrake (*Tadorna cornuta*) were found dead on the shores of Douglas Bay. The former was discovered "sitting upon a stone with the head folded upon the back." A Heron was caught alive by some boys, who ran it down with a dog, and another, which was brought to Mr. Adams dead, was said to have fallen lifeless from the air while flying. Flocks of Gulls, chiefly of the Black-headed species, *Larus ridibundus*, though a good many Herring Gulls were also present, spent weeks among the houses of Douglas, being fed by the residents in the roadways and gardens. On Dec. 23rd, and on several subsequent dates, I saw, in Douglas Bay, a Black-headed Gull with a complete dark hood.—P. RALFE (Laxey, Isle of Man).

Common and Lesser Terns in the Outer Hebrides.—Mr. Howard Saunders, in his 'Manual of British Birds,' p. 631, states that he has no conclusive evidence of the occurrence of *Sterna fluviatilis* in the Outer Hebrides. When staying at Stornoway with a friend last August we were both somewhat anxious to obtain a specimen of the Arctic Tern (*S. macrura*), and accordingly rowed out one day to some low islands to the east of the harbour, where Terns were swarming; but the proportion of the Common to the Arctic species was roughly 15 to 1. I was fortunate enough to obtain a specimen of the latter, and my friend shot one of the Common species in mistake for an Arctic Tern; so we had ample opportunity for identification. Not being aware of its hitherto unrecorded existence in these parts, we unfortunately did not preserve the bird. Later in the month, when at Barra, there was a small rock in Vatersay Sound which was almost always covered with old and young Common Terns. The reason for this bird having been overlooked in the Outer Hebrides may no doubt be accounted for by the fact (as stated by Mr. Howard Saunders) that when the Common and Arctic Terns inhabit the same area they frequently

shift their quarters from year to year. On Aug. 3rd we both observed an adult Lesser Tern (*S. minuta*) rise from a cockle-bed in Broad Bay, Stornoway.—JOHN H. TEESDALE (St. Margaret's, West Dulwich).

The Sanderling in Australia.—In the middle of July, 1894, when out for a stroll along the beach, I had a family shot among a party of waders a mile or two south of Point Cloates (which is situated at the base of the North-West Cape peninsula). I picked up eight Turnstones, *Streptilas interpres*, two Little Sandpipers, and two other waders, which lacking the hind toe at once caught my attention. None of my books here containing any reference to the Sanderling, *Calidris arenaria*, I made a skin of one of my specimens, and forwarded it to Mr. A. J. Campbell, of Melbourne, who in turn sent it to Colonel Legge. He replies:—" *Calidris arenaria* in abraded plumage, with new winter feathers coming on back and wings." From Mr. Campbell's note in the 'Transactions of the Royal Society of Victoria,' it seems that only one other occurrence of the species has been noted here, namely, in New South Wales. Probably the bird visits these shores more often than is suspected.—THOMAS CARTER (Point Cloates, viâ Carnarvon, West Australia).

[This occurrence is noteworthy, for Mr. Seebohm, in his fine quarto work on the Geographical Distribution of the *Charadriidæ* and *Scolopacidæ*, makes no mention of the occurrence of the Sanderling in Australia. But so long ago as April, 1844, two examples of this bird were obtained by John Macgillivray in Sandy Cove, N. S. Wales, and are preserved in the Derby Museum, Liverpool (*cf.* Newton in 'Records of Australian Museum,' vol. ii. p. 22; and 'Nature,' 23rd June and 7th July, 1892.—ED.)]

SCIENTIFIC SOCIETIES.

LINNEAN SOCIETY OF LONDON.

May 2nd, 1895.—Mr. C. B. CLARKE, F.R.S., President, in the chair.

Prof. J. W. Carr and Mr. W. Will were admitted Fellows, and Drs. C. Nordstedt, of Lund, Rudolph Philippi, of Santiago, and M. Woronin, of St. Petersburg, were elected Foreign Members.

Mr. H. M. Bernard showed under the microscope the circumscribed patches of setæ above and below the stigmata on the pupa of the Vapourer Moth, *Orgyia antiqua*. The arrangement suggested a vanished notopodium just where in the Hexapods a dorsal branch of a parapodium ought to have vanished, according to the exhibitor's method of deducing the different groups of the Arthropoda from their Annelidan ancestors, as sketched in his recent paper on the *Galeodidæ*.

Mr. E. M. Holmes exhibited some new British Algæ from Dorsetshire and Sussex; amongst others *Ulrella confluens* and *Ectocarpus Reinboldi*,

both discovered last month at Weymouth, and the latter previously known only from the Baltic.

Mr. J. E. Harting exhibited and made remarks on a specimen of *Cuculus canorus* in the rare hepatic plumage (*Cuculus hepaticus*, Sparmann), recently obtained at Bishop's Waltham, Essex.

Mr. W. T. Thiselton Dyer, C.M.G., then gave an abstract of a paper by the late Mr. John Ball, F.R.S., "On the distribution of Plants on the southern side of the Alps," prefaced by some account of the author's life and special work in relation to the alpine Flora.

May 24th: Anniversary Meeting. — Mr. C. B. CLARKE, F.R.S., President, in the chair.

The Rev. A. Thornley and Mr. Rudolf Beer were admitted Fellows of the Society.

The Treasurer presented his Annual Report, duly audited, and the Secretary having announced the elections and deaths during the past twelve months, the usual ballot took place for new members of Council. The following were elected:—Prof. J. B. Farmer, Mr. A. Gepp, Prof. Howes, Dr. St. G. Mivart, and Mr. A. S. Woodward.

On a ballot taking place for the election of President and Officers, Mr. Charles Baron Clarke was re-elected President; Mr. Frank Crisp, Treasurer; Mr. B. D. Jackson, Botanical Secretary; and Prof. G. B. Howes, Zoological Secretary.

The Librarian's Report having been read, and certain formal business disposed of, the President delivered his Annual Address, prefaced by some remarks on the present position of the Society. On the motion of Sir Joseph Hooker, seconded by Dr. John Anderson, a vote of thanks was accorded to the President, with a request that he would allow his Address to be printed.

The Society's Gold Medal was then formally awarded to Prof. Ferdinand Cohn, of Breslau, and was received on his behalf by Mr. B. D. Jackson for transmission through the German Embassy.

The President having called attention to the retirement of the Zoological Secretary, Mr. W. Percy Sladen, after holding office for ten years, an announcement which he felt sure would be received with universal regret, it was proposed by Mr. Carruthers, seconded by Mr. Crisp, and supported by Mr. Charles Breeze, "That the Fellows of this Society, regretting the retirement of Mr. Walter Percy Sladen from the post of Zoological Secretary, which he has occupied for the past ten years, desire to record upon the Minutes of the Society's Proceedings an expression of their high appreciation of the services which he has rendered to the Society, and of the very able manner in which he has at all times discharged the duties of his office."

This resolution, having been put, was carried unanimously, and after a sympathetic reply from Mr. Sladen, the meeting adjourned to June 6th.

In the evening a number of Fellows of the Society dined together at the Grand Hotel, Charing Cross, the President occupying the chair, and being supported by several distinguished visitors.

ZOOLOGICAL SOCIETY OF LONDON.

May 7th, 1895.—Sir W. H. FLOWER, K.C.B., F.R.S., President, in the chair.

The Secretary read a report on the additions to the Society's Menagerie during the month of April, and called attention to two specimens of the Irish Stoat, presented by Viscount Powerscourt; also to two Polar Hares from Norway, presented by Mr. O. Gude; and to specimens of the peculiar Parrakeet of Antipodes Island, *Cyanorhamphus unicolor*, presented by the Countess of Glasgow, Sir Walter E. Buller, and Mr. W. E. Collins.

A letter was read from Dr. F. A. Jentink concerning a Monkey lately described as *Cercocebus atterimus*, of which the type had been acquired by the Leyden Museum. Dr. Jentink considered this Monkey to be the same as *Cercocebus albigena*, Gray.

Mr. J. H. Gurney exhibited and made remarks on a rare Kingfisher, *Alcedo beavani*, obtained in Ceylon by Mr. A. L. Butler.

Mr. G. F. Scott Elliot made some remarks on the fauna of Mount Ruwenzori, in British Central Africa. He stated that Elephants occur in great numbers on the east side of the mountain. There were also many still living, and vast stores of ivory, in the Congo Free-State, just beyond the south-west corner of the English sphere of influence. He pointed out the presence of the Hippopotamus in the Albert-Edward Nyanza, and its abundance in the Kagera River. It was found frequently in the country of Karagwe, usually near the marshy lakes leading to the Kagera. On the alluvial plains about the east of Ruwenzori Jackson's Hartebeest, *Bubalis jacksoni*, the Kob, *Cobus kob*, and another Waterbuck (perhaps of a new species) were common. No Buffaloes were seen. A Bushbuck also occurred on Ruwenzori, from 7000 to 8000 feet. Of Monkeys he had noticed the presence of a black and white *Colobus*, which he could not identify, and of at least two other species, probably a *Cercopithecus* and a Baboon. Some small Mice brought home had not yet been identified. Leopards were numerous, and Lions were also common on the lower grounds. Two species of Sunbird were brought back, one of which ascends to 11,000 feet on Ruwenzori. Mr. Scott Elliot concluded by remarking that the general idea of distribution gathered from the flora seemed to confirm such data as he could gather from the fauna of the country which he traversed during his journey.

Messrs. F. E. Beddard and P. Chalmers Mitchell made a communication on the structure of the heart in the Alligator, as observed in specimens that had died in the Society's Menagerie.

Mr. Chalmers Mitchell described the anatomy of the Crested Screamer, *Chauna chavaria*, pointing out some resemblances between the alimentary canal of that bird and the Ostrich, and giving a detailed comparison of the structures of *Chauna chavaria* and *Palamedea cornuta*.

A communication was read from Dr. Percy Rendall containing field-notes on the Antelopes of the Transvaal.

Dr. St. George Mivart read a paper on the skeleton of *Lorius flavo-palliatu*s as compared with that of *Psittacus erithacus*.

May 21st.—Lt.-Col. GODWIN-AUSTEN, F.R.S., V.-P., in the chair.

Mr. Sclater made some remarks on the Zoological Institutions he had recently visited in Egypt, namely, the new Zoological Garden at Gizeh, the Zoological Museum in the Government Medical School at Cairo, and the Ostrich-farm at Matarieh.

Mr. Howard Saunders exhibited and made some remarks on a Duck, believed to be a hybrid between the Wigeon and some other species undetermined, which was shot on the Moy Estuary, Co. Mayo, last winter.

Dr. R. Bowdler Sharpe gave an account of the ornithological collection made by Dr. Donaldson Smith, during his recent expedition into Somaliland and Gallaland, containing about 500 specimens, referable to 182 species, of which twelve were new to science.

Mr. G. A. Boulenger read a synopsis of the genera and species of Apodal Batrachians, and gave a description of a new genus and species proposed to be called *Bdellophis vittatus*.

Lt.-Col. H. H. Godwin-Austen read a list of the Land-Molluscs of the Andaman and Nicobar groups of islands in the Bay of Bengal, and gave descriptions of some new species, together with a complete account of the distribution of all the species in the various islands of these two groups.

A communication was read from Dr. J. Anderson, containing the description of a new species of Hedgehog from Somaliland, which he proposed to name *Erinaceus sclateri*.

A communication from Mr. R. Lydekker contained notes on the structure and habits of the Sea-Otter, *Lutra lutris*.

A communication was read from Dr. B. C. A. Windle containing remarks on some double malformations observed amongst fishes.

Mr. F. E. Beddard read a paper on the visceral and muscular anatomy of *Cryptoprocta*, dealing chiefly with the brain, alimentary canal, and muscles of this Carnivore.—P. L. SCLATER, *Secretary*.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 1st.—Prof. RAPHAEL MELDOLA, F.R.S., President, in the chair.

Mr. Oswald H. Latter was elected a Fellow; and Dr. C. G. Thomson, of the University, Lund, Sweden, was elected an Honorary Fellow, to fill the vacancy caused by the death of Pastor Wallengren.

Mr. H. St. J. Donisthorpe exhibited a variety of *Rhagium bifasciatum*, a longicorn beetle, taken in the New Forest; in which the elytra were of a light testaceous colour.

Mr. Waterhouse exhibited a living larva of a longicorn beetle found in a boot-tree which had been in constant use by the owner for fourteen years, the last seven of which were spent in India. The specimen was brought to the British Museum on May 6th, 1890, and was put into a block of beech wood, in which it had lived ever since; it did not appear to have altered in any way during these five years. It had burrowed about eight inches, and probably made its exit accidentally. Mr. Blandford referred to a similar case which had come under his notice.

Mr. C. G. Barrett exhibited a long series of the dark and strongly-marked varieties of *Agrotis cursoria* and *A. tritici*, taken on the sandhills of the north-east coast of Scotland by Mr. Arthur Horne, of Aberdeen.

Mr. Dale exhibited a specimen of a *Sesia*, supposed to be a new species, from the New Forest.

Mr. O. E. Janson exhibited a remarkable species of *Curculionidæ* from the island of Gilolo, having exceedingly long and slender rostrum, antennæ, and legs; it was apparently an undescribed species of the genus *Talanthia*, Pascoe.

Mr. Nelson Richardson called attention to a paper by himself, in the 'Proceedings of the Dorset Natural History and Antiquarian Field Club,' on the subject of Dorset Lepidoptera in 1892 and 1893.

Mr. W. L. Distant communicated a paper "On a probable explanation of an unverified observation relative to the family *Fulgoridæ*." In this paper the author cited the expressed opinions of certain naturalists as to the luminous properties of some species of this family. In the discussion which ensued Mr. Blandford said he thought further evidence was required on the subject of the alleged luminosity in the *Fulgoridæ* before the statements contained in Mr. Distant's paper could be accepted.

Mr. J. J. Walker, R.N., contributed "A Preliminary List of the Butterflies of Hong-Kong, based on observations and captures made during the winter and spring of 1892—1893." Prof. Meldola commented on the interesting character of the paper from an entomological point of view, and the value of the observations therein on the geology, botany, and climate of Hong-Kong.—H. Goss, *Hon. Secretary*.

